MVGA02 User Manual

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1. Overview

MVGA02 is a multimedia product based on DWIN K600+ module, which supports single-channel analog CVBS format video input(NTSC and PAL) and video/audio playing. The product supports USB flash drive and Micro SD card for video and audio playing. The product provides 2-watt audio amplifier for external speaker. The main features are as follows:

- VGA output, can drive the projector, display, and television;
- Wide operating voltage range: +6V ~ +42V;
- All features of DGUS system;
- Two layers display, support DGUS HMI layer and video layer (analog video layer or digital video layer). DGUS HMI layer can be overlapped on video layer;
- Analog video layer supports PIP (picture in picture) display of 320x240，400x480，400x600，640x480，640x600，800x480 or 800x600 resolution;
- Digital video layer supports PIP display of 640x600，800x480 or 800x600 resolution;
- Support USB flash drive and Micro SD card for video and audio playing, 2-watt audio amplifier for speaker;
- Use DGUS serial port COM2 or user's serial port to send commands to control;

2. User Command Set

User can use DGUS serial port COM2 to send commands (refer to Section 4.8 "Firmware parameter settings (0x07)" of "DWIN DGUS LCMs Development Guide Ver3.3"; Mode=0x04), or user can also use its own serial port (TTL or RS232 level) to send commands.

Serial Port Mode：

115200bps，N81（1 start bit, 8 data bits, 1 stop bit, no parity bit）。

Data Frame Structure：

Address	0x00	0x02	0x03	0x04
Definition	0xAABB	LEN	CMD	DATA_Pack
Explanation	Frame head	Length of subsequent data (CMD + DATA_Pack)	Command	Data

CH-1 channel is used when in analog video mode (CH = 0x01). The user must use 115200bps baud rate to send commands.

Command Set Specification：

Important note, X_H, X_L must be even when in PIP display mode. For example, coordinate (12, 12) is effective, but coordinate (11, 12) is not allowed.

- Switch to full screen display of DGUS HMI layer.

  CMD = 0x01, command is: AA + BB + LEN(0x01) + CMD(0x01).

- Open a 320x240 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.

  CMD = 0x02, command is: AA + BB + LEN(0x06) + CMD(0x02) + CH(0x01) + X_H + X_L + Y_H + Y_L.

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- Open a 400x480 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.
  CMD = 0x0A, command is: AA + BB + LEN(0x06) + CMD(0x0A) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Open a 400x600 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.
  CMD = 0x03, command is: AA + BB + LEN(0x06) + CMD(0x03) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Open a 640x480 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.
  CMD = 0x04, command is: AA + BB + LEN(0x06) + CMD(0x04) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Open a 640x600 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.
  CMD = 0x0B, command is: AA + BB + LEN(0x06) + CMD(0x0B) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Open an 800x480 resolution analog video window in PIP mode, the analog video window is originated at coordinate of X_H, X_L, Y_H, Y_L.
  CMD = 0x05, command is: AA + BB + LEN(0x06) + CMD(0x05) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Switch to full screen display of analog video layer which is originated at coordinate of X_H, X_L, Y_H, Y_L. X_H, X_L, Y_H, Y_L must be all zeros.
  CMD = 0x06, command is: AA + BB + LEN(0x06) + CMD(0x06) + CH(0x01) + X_H + X_L + Y_H + Y_L.

- Turn on the overlap function, DGUS HMI layer is overlapped on analog video layer or digital video layer. Words and figures in DGUS HMI layer can be displayed in video layer.
  CMD = 0x07, command is: AA + BB + LEN(0x03) + CMD(0x07) + COLOR(2 Bytes)。COLOR is the setting of transparent color of DGUS HMI layer, which is 16bit. For example, COLOR = 0xFFFF, denotes pure white is the transparent color, anything which is not in pure white in DGUS HMI layer can be displayed in analog/digital video layer.

- Turn of the overlap function
  CMD = 0x08, command is: AA + BB + LEN(0x01) + CMD(0x08).

- Open an 800x480 resolution digital video window in PIP mode
  CMD = 0x09, command is: AA + BB + LEN(0x05) + CMD(0x09) + X_H +X_L + Y_H + Y_L.

- Open a 640x600 resolution digital video window in PIP mode
  CMD = 0x10, command is: AA + BB + LEN(0x05) + CMD(0x10) + X_H +X_L + Y_H + Y_L.

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- Open a 800x600 resolution digital video window in PIP mode。
  CMD = 0x11, command is: AA + BB + LEN(0x05) + CMD(0x11) + X_H +X_L + Y_H + Y_L.

- Turn off the speaker.
  CMD = 0x12, command is: AA + BB + LEN(0x01) + CMD(0x12).

- Turn on the speaker.
  CMD = 0x13, command is: AA + BB + LEN(0x01) + CMD(0x13). The speaker is turned on by default after power up.

- Volume up.
  CMD = 0x14, command is: AA + BB + LEN(0x01) + CMD(0x14).

- Volume down.
  CMD = 0x15, command is: AA + BB + LEN(0x01) + CMD(0x15).

- Play video files under the root directory of USB flash drive or Micro SD card.
  CMD = 0x16, command is: AA + BB + LEN(0x02) + CMD(0x16) + SEQ. This command is used to play video files under root directory according to the assigned sequence number. For example, SEQ = 0x00, play the No. 1 video file under the root directory; SEQ = 0x01, play the No. 2 video file under root directory.
  Important note: The files are sequenced according to the copying sequence. The user shall copy 00.avi file into the Micro SD card first (or USB flash drive), then 00.avi file will be the No. 1 and be played when SEQ = 0x00. The user shall copy 01.avi file into Micro SD card after 00.avi, and the 01.avi file will be the No. 2 and be played when SEQ = 0x01. The rule for audio file playing sequence is the same.

- Play audio files under the root directory of USB flash drive or Micro SD card.
  CMD = 0x17, command is: AA + BB + LEN(0x02) + CMD(0x17) + SEQ. This command is used to play audio files under root directory according to the assigned sequence number. For example, SEQ = 0x00, play the No. 1 audio file under the root directory; SEQ = 0x01, play the No. 2 audio file under root directory.

- Pause or resume playing.
  CMD = 0x18, command is: AA + BB + LEN(0x01) + CMD(0x18).

- Exit playing.
  CMD = 0x19, command is: AA + BB + LEN(0x01) + CMD(0x19).

- Play the previous file.
  CMD = 0x1A, command is: AA + BB + LEN(0x01) + CMD(0x1A).

- Play the next file.
  CMD = 0x1B, command is: AA + BB + LEN(0x01) + CMD(0x1B).

- Fast forward playing.

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CMD = 0x1C, command is: AA + BB + LEN(0x01) + CMD(0x1C).

◆ Fast reverse playing.

CMD = 0x1D, command is: AA + BB + LEN(0x01) + CMD(0x1D).

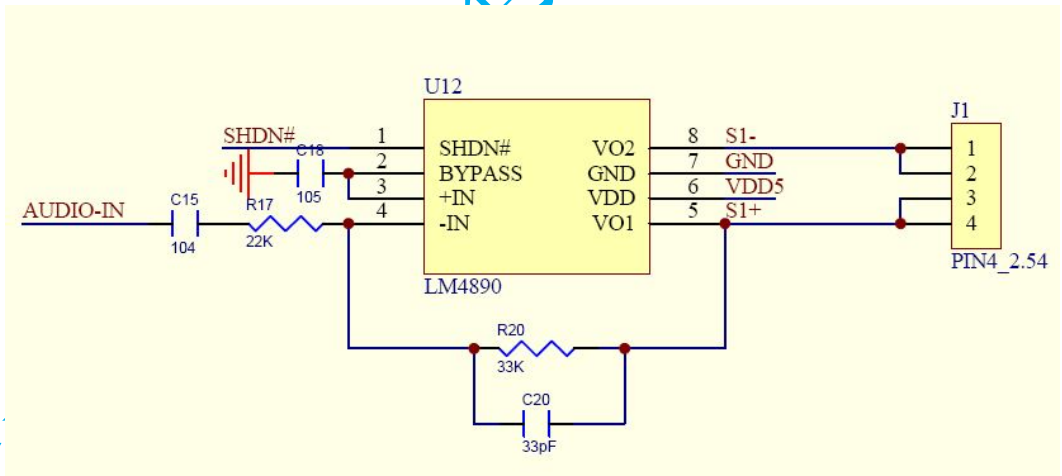
Important note: 5 seconds interval must be guaranteed when switching sending video/audio command (0x14 to 0x1D) to sending another video/audio command (0x14 to 0x1D). Otherwise, the command might be missed occasionally.

Display switching command (for example, CMD = 0x11) and video/audio command (for example, CMD = 0x16) can be sent together as one command. Video/audio command must be put at first, which is followed by display switching command. For example, user wants to play the No.1 video file, and in the meanwhile switch to full screen digital video display, the following command should be sent:
AA BB 02 16 00 AA BB 01 11 00 00 00 00.

3. User Hardware Interface

◆ External speaker interface:

The product provides one 4-pin 2.54mm-spacing socket interface, with the schematic diagram as follows:



4. Revise History

Dates	Revise Contents	Edition
2013.09	First release	V1.0

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